

 <b>TUNDRA ENGINEERING INC</b>	<b>TUNDRA ENGINEERING CONTROLLED DOCUMENT</b>		
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	Subject:	<b>AFE Estimate Classes</b>	

## **Cost Estimating**

Cost estimating is one the most important aspects of any successful project. If the initial estimate is not accurate and is priced too high, the project may be deemed uneconomic and resources reallocated to more viable projects. If a project makes it past the vetting phase, the estimate continues to evolve throughout the lifecycle of the project as assumptions are verified.

Tundra's vast and recent project experience provides us with an extensive database of costs to leverage for new projects. One of the best ways to forecast future projects is to use relevant information from past projects. Having access to this information allows Tundra to provide relatively accurate cost estimates at the early stages of a project.

Every business uses their own interpretation of the various classifications of cost estimates, but the following stages of cost estimating fall within the industry accepted ranges:

- **Class V:** -50% to + 100%
  - Conceptual phase. This estimate is used for project viability and, sometimes, a comparison between several different options to determine various return on investments.
  - Very little scope definition is available at this stage.
- **Class IV:** -20% to + 30%
  - Design Basis Memorandum (DBM) phase. This estimate usually accompanies the DBM and defines a number of variables for the project. No other options are being evaluated at this stage as they have been vetted through the Class V estimate(s).
  - More scope definition is available. Usually a preliminary Plot Plan, Process Flow Diagrams (PFDs) and a Single Line Diagram have been created.
- **Class III:** -15% to + 20%
  - Front End Engineering and Design (FEED) phase. This estimate is generated as the result of detailed engineering design.
  - Scope has been clearly defined. Detailed drawings such as Isometrics, Pile Layouts and Electrical Layouts have been generated. An Authorizing for Expenditure (AFE) is created based on this level of estimate.
- **Class II:** -10% to + 15%
  - Bid tender phase. This estimate is based on costs incurred to date and the return of all bids packages from vendors and contractors.
  - Scope is finalized and all engineering design deliverables are complete. AFE costs are verified based on this level of estimate.
- **Class I:** -5% to 10%
  - Final cost check phase. This estimate is based that a majority of costs that have been incurred to date.
  - All major equipment has been delivered with most of the fabrication work now complete. Refinement to the estimate is typically only required for certain sections of the project that may have been deemed higher risk. AFE costs are once again verified and trends are developed to predict over or underruns.

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